Implementation of Business Support Application for Telecommunication Equipment Supplying Company

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Summary: Ericsson Nikola Tesla is implementing SAP R/3 business application on its TTC process (Time To Customer). Implementation project will result with integrated business environment where all daily business activities are on-line updating central controlling information, necessary for efficient and cost-effective management of core business. Implementation project is established in a big multi-project organization, involving business process experts from all parts of the company, both as key users and as IS/IT experts.

I. INTRODUCTION

Many telecom suppliers (e.g. Cisco, Wal-Mart, FedEx) have radically changed their way of doing business by utilising IT (Information Technologies) in new innovative ways, particularly in business processes, related to logistics and the customer dialogue. Ericsson has substantial opportunities for improvements by deploying IT in the same or related areas.

Today we may talk about two opposite attitudes towards classical data handling paradigm. There are some statistical estimations about relation between well-structured and not structured information, created and used in office environment. Such estimations are suggesting domination of unstructured information (90%) comparing to the other type [1]. DBMSs (DataBase Management Systems) are naturally dealing with well-structured information in highly efficient and effective manner. At the same time unstructured information is very simply treated by such systems – pure "store and retrieve" function. In this "Internet era" we could consider this as a bit more conservative approach, summarized by following statement: "Everything is in database!" On the contrary, pieces of information (objects), produced with state-of-the-art tools in modern office environment, tend to be more and more dispersed all along the enterprise (even worldwide). Classical approach, tending to "... put everything in database...", is starting to show some shortcomings. It's time to modify mentioned statement into: "Everything is database!" Is Internet/Intranet concept proper infrastructure to host new definition of database?

II. BACKGROUND

Ericsson Nikola Tesla (ETK) became a part of Ericsson Corporation in 1995. Before that it was an independent company, but a licensed partner of Ericsson. Consequences of such a position were that a lot of standards in IT field was simply translated into a company environment (because dealing with the same products definitely leaded into using the same environment – tools, applications, databases...). But, there was also a significant degree of freedom to choose other, different tools or applications to run its own business.

The similar way of policy could also be found in other Ericsson companies worldwide – particular IT solutions are common to all companies, but some environments are totally free to develop some aspects of IT on their own. Common opinion of Ericsson's IT managers, expressed on plenar ITRG (IT Reference Group), held in Dublin, October 1997, is that sometimes such a liberal attitude is motivating different approaches to same problems, which then creates a lot of experience and enables definition of best practice. On the other hand, this may lead into rather "chaotic" situation, where different solutions "can't talk to each other".

Anyway, global corporate IT body used to issue recommendations rather then directives...

In such a situation ETK management team started a global company project to define IT Strategy of the Company for the next 2-3 years period of time [2]. Project, started in Spring 1996, was concluded in February 1997. One of major conclusions of the project was a proposal to open a new project for evaluation and implementation of a new business package to support main Company business processes. First phase, evaluation of possible/available IS (Information System) products was performed during the first half of 1997. Evaluation process and related tools were described in [3].

The final evaluation result was choice of SAP's product R/3. The decision was further supported by a global corporate recommendation. Also, a couple of other solutions were discussed and R/3 was chosen as a platform to integrate Ericsson's business worldwide. A significant step from rather liberal "recommending" to more formal "directing" way of corporate co-ordination was obvious.

Anyway, for ETK this directive came a bit too late (while evaluation efforts were taken anyway). Fortunately, ETK's decision was fully compatible with releasing of corporate directive.

III. SAP R/3 PROJECT ESTABLISHMENT

One of the major problems with R/3, as with a product to be implemented over one's business, is a highly complex and tricky process of overall business change management. While it is also opportunity for a company, implementing R/3, to improve its business processes, such a project should be treated not only as IT project, but as an overall improvement program for the company.

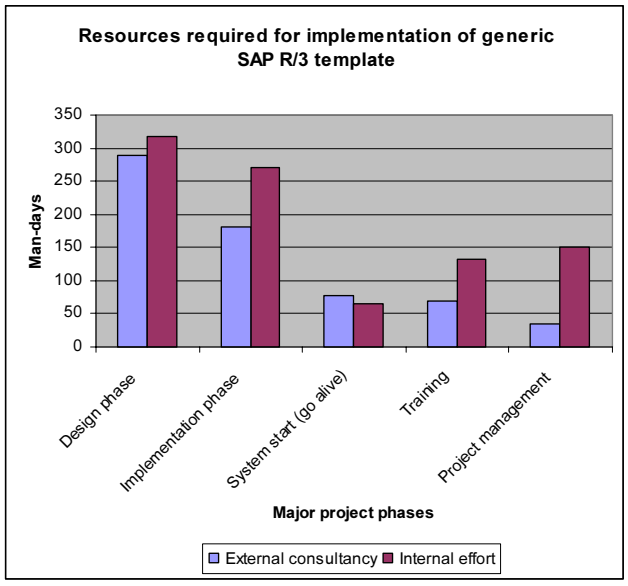
Therefore, SAP as R/3 supplying company, as well as other consultant companies, supporting R/3

Project phase	External consultancy (*)										Internal effort (*)
	General	BC	FI	AM	CO	HR	SD	MM	PP	Total	
Design phase	22	0	12	7	45	38	40	40	85	289	318
Implementation phase	29	0	12	6	23	23	23	23	43	182	270
System start (go alive)	7	0	10	10	10	10	10	10	10	77	65
Training	8	10	5	3	9	9	8	8	10	70	133
Project management	35	0	0	0	0	0	0	0	0	35	150
Total efforts	**101**	**10**	**39**	**26**	**87**	**80**	**81**	**81**	**148**	**653**	**936**

(*) all efforts are expressed in man-days

Table 1 – Cost estimation template (applicable for implementation of generic SAP R/3 template)

implementation (e.g. Price Waterhouse, Andersen Consulting, Ernest & Young, etc.) are very proactive in inventing methods and tools for quicker implementation of R/3 into the company's business. E.g. SAP's ASAP (Accelerated SAP) implementation method is introducing best implementing practices, combined with change management tools. Table 1 and figure 1 show recent standards in quick implementation of generic R/3 template, expressed in quantity of days required for particular activities. If days are translated into money, this could easily be applied as an input to create a budget of the R/3 implementation project.



IV. NEBIS PROJECT

Project of SAP R/3 implementation in ETK started during the Fall 1997 as NEBIS project (NEBIS stands for New ETK Business Information System). IBM was chosen as a consultancy partner. Feasibility study for implementation of SAP R/3 business package in ETK was defined as a follow up to the IS/IT Strategy Definition project (part of which was mentioned business package selection subproject).

Figure 1 – Plan of resources

In order to prepare ETK for complex and costly task of SAP R/3 implementation, Feasibility study was performed in order to identify proper resources, that had to be mobilized and trained. Since ETK was facing one of the biggest investments in its history up to now, precise preparation had to be made in order to carry out the multi-project of SAP R/3 implementation.

IV.1 FEASIBILITY PHASE

Main results, that were reached out of Feasibility study phase, were:

- hardware and software purchased for pilot,
- pilot in place,
- business model accepted ,
- key people trained for execution phase,
- project specification for execution phase.

It took some 3 months to end Feasibility phase. Detailed plan for Execution phase, as one of the most important documents that came out from Feasibility phase, shows all the complexity of SAP R/3 implementation task.

Documents, which could be regarded as the most important output from Feasibility phase (to be used as an input to the next, Design phase), are as follows:

As-Is

As-Is Model is a comprehensive, structured, and easy to understand description of the current business processes, and functions covered by the Project Scope. The As-Is Model can significantly differ from the future model of the company.

To-Be

To-Be Model is a conceptual design of the structure, processes, and functionality of the proposed new system. The To-Be Model forms the basis of the choice of system functions, the definition of fit-gap and the further work of the project.

The Business Function Breakdown table defines the scope of To-Be documentation. To-Be Model is documented in form of Business Transaction Scripts and Visio Event-driven Process Chain diagrams. At the feasibility study stage the documentation was done on high level.

Fit-Gap

Fit-Gap Analyses identifies the scope of the planned SAP R/3 implementation, i.e. which business functions and business sub-functions are to be covered. It is not a

detailed configuration, the only purpose is to confirm where SAP R/3 fits and to find any major gaps in functionality, data and interface estimates.

Fit-Gap Analyses together with the To-Be Business Transaction Scripts provides the base for a more detailed design during prototyping.

Scope of NEBIS project

A specified range of functionality, covered by SAP R/3, as it was described in the To-Be and Fit-Gap documents, could be summarized in following statements:

- replace existing legacy systems in ETK,
- solve Y.2000 problem of existing Information Systems in ETK,
- improve/re-engineer existing business processes.

The main goal of this work was to analyze existing business processes and to design future business processes and compare this new functionality with the relevant SAP modules. This analysis proposed following SAP modules to be included in the scope of the project: FI, CO, AM, MM, SD and PP.

Project Systems (PS) and Human Resources (HR) modules were also shortly reviewed in this phase. As a result of this work, a first draft of possible implementation of those modules was prepared. Full feasibility study of PS module was not part of the scope of this phase, Key User Education, TO-BE documentation and FIT/GAP analysis was not done yet.

Figure 2 – Scope of the NEBIS project

IV.2 DELIVERABLES OF FEASIBILITY PHASE

Some important deliverables of Feasibility phase will be described in more details.

Data migration

As described in the As-Is documentation, significant part of the business processes is performed in today's legacy systems (e.g. IBM's application COPICS). Other parts of the existing Information System are not integrated, and there are independent 'islands', containing vital data.

Therefore, data migration is considered as a critical item for the success of the SAP R/3 implementation in ETK. So, a separate team was dedicated to work on this item.

As-Is results

Preparing As-Is documentation helped to understand complexity of ETK business process and Information System, and was used as a starting point for the design of the To-Be model. It resulted in the first joint document created by the NEBIS project team.

To-Be results

In this document a functional breakdown of SAP R/3 reference model was specified in order to cover the future business requirements of ETK, and they are described in a more detailed way in special Business Transaction Scripts as it is suggested by ISIM (IBM SAP Implementation Methodology).

Fit/Gap results

In this document three columns are defined for each SAP R/3 module:

1. The ETK business process break down,
2. SAP R/3 reference model break down, referring to respective ETK process,
3. In case there was no SAP R/3 equivalent, the gap was defined as a need for development of new functionality in addition to the standard SAP R/3 system.
   (Intention of the project is to minimize the additional development.)

IV.3 IMPLEMENTATION PHASE

Implementation phase is the major part of the project. It consists of several sub-phases.

Prototype and Business model phase

This phase is resulting in the Prototype system covering approximately 70% of the specified functionality. It is basically a customizing and testing job, with a limited, manually entered master data. No development activity is planned in this phase, but all development requirements must be specified here in detail (interfaces, special functions, special reports).

Configuration and Development phase

This phase is resulting in a fully configured Productive system, meeting all the ETK requirements as it is defined

in the To-Be model, together with the necessary additional developments for interfaces and functionality.

Integration test

This activity has to be performed in order to test and prove the integrity of the new system configuration in relation to the future business processes.

A structured description of the company's key cross-functional business flows must also be prepared. It is then used to test the integration aspects of the new system.

End-user training

The future end-users of the new system must be prepared with adequate knowledge to be able to complete their task efficiently and effectively.

Go live

It is the last project phase before the *Big bang***,** i.e. before real productive start. Here data from the old system must be extracted, checked, converted and loaded (automatically or manually) into the new SAP R/3 system.

The new SAP system must be prepared for full-time productive use and perform the actual switch over from old to new systems.

Productive start

After the *Big Bang***,** the system starts to be operational with all the functions performing in the real world.

IV.4 NEW BUSINESS PROCESS FUNCTIONALITY

During the Feasibility phase it was analyzed in detail what functionality from different SAP R/3 modules should be implemented in ETK business processes. Some of the most important findings are listed here.

FI/AM Modules

Financial Accounting collects all the data in the company relevant to accounting, providing complete documentation and comprehensive information, and is at the same time an up-to-the-minute basis for enterprise-wide control and planning. Treasury is a complete solution for efficient financial management that ensures the liquidity of your company worldwide, structures financial assets profitably, and minimizes risks.

Concerning the required functionality of ETK, practically all is covered by the Croatian version of the SAP FI module, but in certain cases additional developments are needed:

- for using different reconciliation accounts for the same vendor, depending on the material, that is being delivered,
- for outgoing bank-transfers the SAP R/3 payment program must be fitted to the local requirements, either special format must be printed or the payment will be performed electronically, depending of the ETK decision,
- customer invoices must be divided in receivables, advances and credits,
- for some assets the relevant employee information must be stored.

CO/EC Modules

Controlling module provides a complete array of compatible planning and control instruments for company-wide controlling systems, with a uniform reporting system for coordinating the contents and procedures of the company's internal processes. Enterprise Controlling continuously monitors company's success factors and performance indicators on the basis of specially prepared management information.

After accomplishing the Fit-Gap analysis of the CO module some organization oriented questions arose:

- Organizational structure of ETK in the CO module, regarding global concepts recommendations,
- ETK's position as a supply center for Ericsson's companies,
- co-operation with PS module, which implementation was delayed in relation to the rest of the R/3 system,

Particularly interested are CO requirements on reporting procedures, specified in table 2.

These report requirements arose regarding the CO module Fit-Gap Analysis, since the SAP/ABAP information technique and the reporting methodology in ETK was completely carried out by the to-be controlling organization. Nevertheless, by the implementation of the SAP R/3 these reporting tasks will be distributed among the other modules to be implemented.

	Reporting requests
1	Profitability of a certain PROJECT
2	Profitability of a certain TENDER
3	Profitability of a certain CUSTOMER
4	Profitability of a certain CUSTOMER ORDER
5	Profitability of a certain CONTRACT
6	Profitability of a certain MARKET by BU
7	Profitability of a certain PRODUCT GROUP
8	Profitability of a certain BU
9	Profitability of a certain PROFIT CENTRE by BU
10	Costs on a certain COST CENTRE
11	Period accumulated actual figures for ORDERS AND SALES BY PRODUCTS
12	Period accumulated actual figures for OPERATING EXPENSES
13	Period accumulated actual figures for PERSONNEL
14	Period accumulated actual figures for INVESTMENTS
15	Period accumulated actual figures for contract by RECEIVING BU
16	Period accumulated actual figures for contract by COUNTERPART
17	Period accumulated actual figures for contract by FINAL CUSTOMER
18	Calculation of PRICES for all INTERNAL ACTIVITIES
19	Allocation of costs for NONMEASURABLE INTERNAL ACTIVITIES
20	Allocation of costs for MEASURABLE INTERNAL ACTIVITIES
21	Planning COST BUDGET
22	Planning NUMBER OF EMPLOYEES (sector, technical structure, BU)
23	Planning NET SALES (ORDERS-BOOKED; ORDER-STOCK)
24	Planning INVESTMENTS
25	Planning CASH FLOW
26	Planning PURCHASING
27	Planning DELIVERIES
28	Planning RESOURCES
29	Planning PRODUCTION
30	Planning INCOME
31	Planning PROFITABILITY
32	Planning INTERNAL SERVICES

Table 2. Reporting from CO module of R/3

MM/PP Modules

Materials Management optimizes all purchasing processes with workflow-driven processing functions, enables automated supplier evaluation, lowers procurement and warehousing costs with accurate inventory and warehouse management, and integrates invoice verification.

Production Planning provides comprehensive processes for all types of manufacturing: from repetitive, make-to-order, and assemble-to-order production, through process, lot and make-to-stock manufacturing, to integrated supply chain management with functions for extended MRP II and electroni
process contr

Figure 4 – Alternatives for problem solution for configuration management of SAP R/3 instalation in ETK

Related to the ETK requirements, within MM and PP modules some open items have to be handled, e.g.:

- Material Number greater than 18 characters,
- interface to PRIM - global Ericsson's Product Information Management database,
- EDI interface,
- interface to bar code system (to be used in store),
- outsourcing of non-core activities from ETK,

etc.

SD Module

Sales and Distribution actively supports sales and distribution activities with outstanding functions for pricing, prompt order processing, and on-time delivery, interactive
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not be covered by SD module, the conclusion was the need of SAP PS module implementation),
- Supply Center/Sales and Operation Planning functions will be covered by SAP PP module SOP functions,
- Market Analyses functions will be covered by SD Sales Support.

Engineering process is, by definition, out of scope of SAP, however the come-out of this process, i.e. the concrete product configuration must be input through interface to SAP database as master data.

PS Module

project, in direct cooperation with Purchasing and Controlling, from quotation to design and approval, to resource management and cost settlement.

During the analysis of ETK business processes and mapping them with the SAP functionality it was clearly shown, that including the PS module into the scope of the next phase is necessary. Main reason for this is the TTC (Time-To-Customer) process flow, that handles customer requirements as projects. It is strongly recommended to keep the PS module implementation in the next phase of the SAP project only for customer projects, because of the complexity of the project, and especially the big bang approach.

HR Module

Human Resources Management provides solutions for

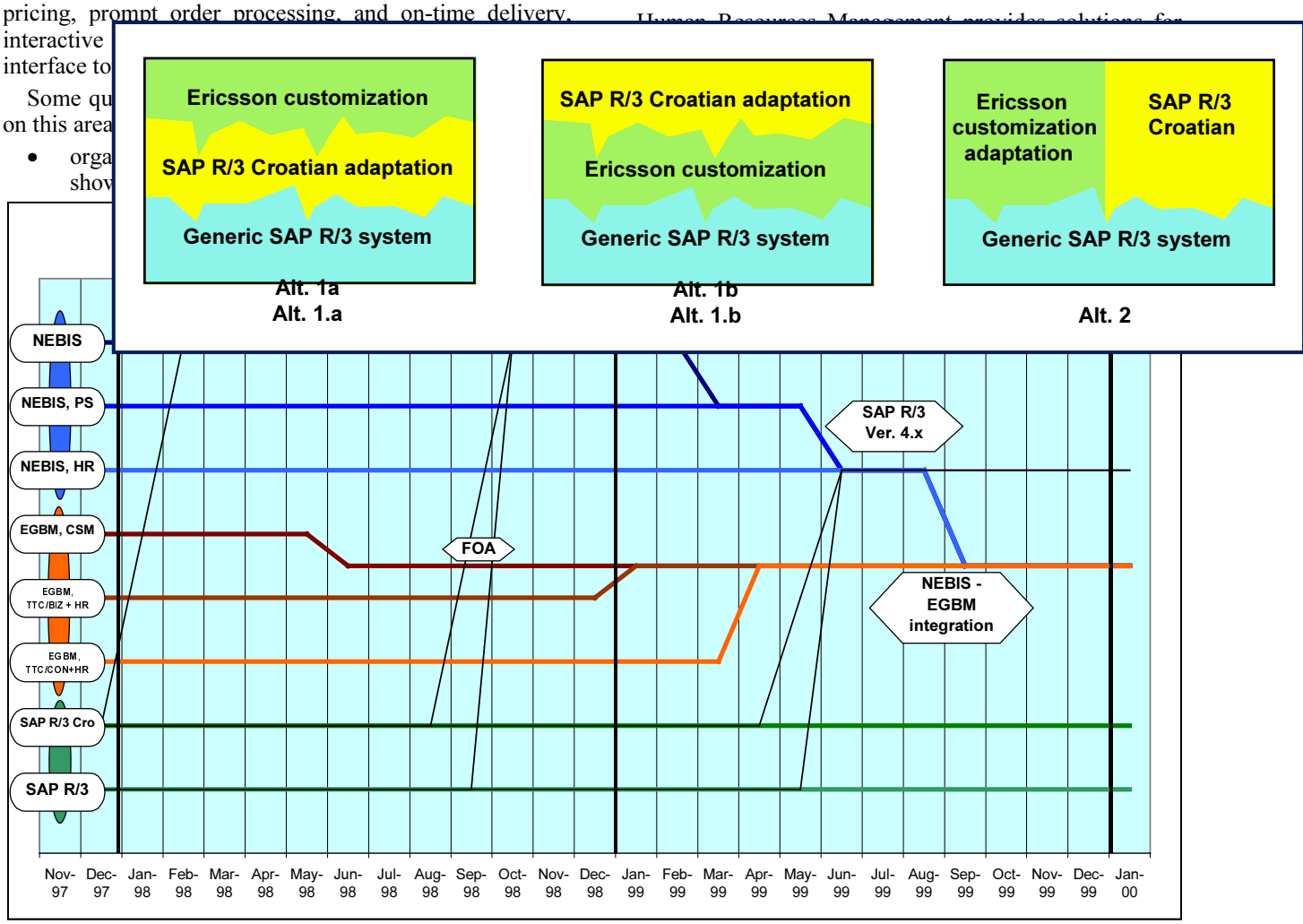

Figure 3 – Configuration management of SAP R/3 instalation in ETK (during and after NEBIS project)

The HR module itself is one of the most complicated SAP R/3 modules regarding functionality (personal development, career development, competence development, payroll system, etc.), and master data (that has to be defined and maintained). Therefore its implementation in ETK was postponed and it was not included in the scope of NEBIS project.

V. CONFIGURATION MANAGEMENT OF SAP R/3 SYSTEM IN ETK

Future configuration management of ETK's SAP R/3 implementation has to obey (figure 3):

- future ETK's business requirements (HR),
- global corporate plans for SAP R/3 implementation (EGBM – Ericsson Global Business Model),
- new releases of both generic and local Croatian SAP R/3 version.

Possible impact of all these factors on configuration management of SAP R/3 implementation in ETK was illustrated in figure 4.

A special workgroup has been created to decide whether local or international version of SAP should be purchased. It was demonstrated by SAP Croatia, that the Croatian version incorporates not only a translation of the English language screens, tables and on-line help documentation, but also significant add-ons and configuration changes, in order to meet local legal regulations, or to accommodate best Croatian business practices. Also SAP Croatia guarantees maintenance of the functionality according to eventual local regulatory changes.

Available Croatian version of SAP R/3 (3.0.D) had significant impact on important decision, that NEBIS project issued regarding its scope: The HR (Human Resources) module of the Croatian version is supposed to be released during 1998. That was one of the reasons HR was not included in the scope of NEBIS.

Also, alternative implementation strategies were investigated during the feasibility study. The basic assumption was, that all COPICS related functionality has to be migrated to avoid building of temporal interfaces.

Two Phases Option

The **first option** was to investigate a **2 phases model**. The target for the first phase was to start production by July 98 with reduced functionality, but cover all functionality required for planned migration. The second phase planned to introduce additional functionality of the selected modules.

One Phase Option

The **second option** was to implement **total functionality** required for all modules in one, more extensive phase, a **later "Big Bang",** and also have all planned migration finished within this phase. With this option, all data for the fiscal year 1998 and related reporting will be out of scope of migration, while all data of the fiscal year 1999 will be handled by SAP already.

Option 2 gives more time to develop and introduce the final concept, resulting in a real "Big Bang". To keep Year 2000 problem handled, productive start was planned for January 4, 1999 for this option, which was finally chosen.

VI. CONCLUSION

Implementation of SAP R/3 system on business processes of such a complex industrial company, as telecommunication supplier is, is very tricky and time-consuming process, while required integration of processes puts strong demands on the scope of such a project. Many generic modules have to be properly customized and mutually connected according to business requirements, but once such a system is in place, it helps the company to manage its business in a much more co-ordinated manner, i.e. efficiently and effectively.

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